
8-3

Environment and Health in Rural Kazakhstan: Linking Agricultural Policy and Natural Resource Management to Rural Welfare

By:

Andrew Jones

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Edited by:

Per Pinstrup-Andersen (globalfoodsystem@cornell.edu) and Fuzhi Cheng
Cornell University

In collaboration with:

Søren E. Frandsen, FOI, University of Copenhagen

Arie Kuyvenhoven, Wageningen University

Joachim von Braun, International Food Policy Research Institute

Executive Summary

Oil revenues and foreign investment in the Caspian Sea's burgeoning petroleum industry have brought Kazakhstan to the attention of governments and businesses worldwide. While Kazakhstan has made considerable economic strides in the past decade, an increasing urban-rural divide has placed poverty and ill health disproportionately on the shoulders of rural residents. The country's bleak state of rural welfare in the past 15 years is largely explained by its inheritance of degraded natural resources from its Soviet forebears, the economic and social turmoil following the collapse of the Soviet Union, and inequitable, poorly implemented land reform and agricultural policies.

Throughout the 20th century, short-sighted environmental policies aimed at enhancing industry and manufacturing helped transform the Soviet Union into an industrial behemoth and world superpower. But this industrial growth transformed the landscape, notably in Kazakhstan, at the expense of the region's rich underlying natural resources. Fragile rangelands and pasturelands were plowed under to grow wheat, arid steppes were deluged with irrigation water to sustain a cotton monoculture, and rivers, seas, and lakes were drained of their vitality and poisoned with industrial effluents. Myopic policies led to a deterioration of air, water, and land; not surprisingly public health in these regions began to plummet as well.

After the collapse of the Soviet Union in 1991, Kazakhstan emerged as an independent state caught in a social upheaval, characterized by mass-scale corruption and power struggles, reshuffling of landownership patterns, and an economic downturn that affected agricultural productivity. With the development of its fossil fuel reserves, Kazakhstan has improved its economy, but not to the benefit of all. Although individual farms (that is, family and household farms) are increasing in number and showing superior productivity compared with corporate farms, legislative, financial, and technological impediments prevent smallholder operations from prospering. Local governments lack the authority and funding to carry out state mandates, resulting in ineffective development programs, poor implementation and enforcement of state

policies, and escalation of wealth consolidation by powerful private citizens. In short, Kazakhstan lacks a cohesive infrastructure to support rural development and agriculture. A declining fodder base from prior rangeland mismanagement, shifting grazing patterns, antiquated irrigation systems, and imperiled watersheds threaten the viability of natural resources. Thus, future policies must seek to overcome a severely degraded environment in addition to inefficiencies in government and infrastructure.

Although efforts are underway to diversify the economy, agriculture is still not a high priority for the government of Kazakhstan. The poor health and welfare of Kazakhstan's millions of agriculture-dependent rural residents highlights the paramount importance of immediately addressing issues of agriculture and rural development. Rural families cannot afford to wait for the Kazakhstan of 2030, the country's ubiquitous propaganda slogan, to fulfill their simple hopes of health and social stability.

Your assignment is to advise the government of Kazakhstan on how best to reform and integrate its policies on land tenure and agriculture with proper stewardship of natural resources to improve rural health and welfare.

Background

Kazakhstan is the second-largest republic among the Commonwealth of Independent States (CIS)¹ and, at 2.7 million square kilometers, is about four times the size of Texas (CIA 2007). It is predominated by vast steppes and expansive grasslands; almost all the territory of the country belongs to the largest riverless area on earth (Baydildina et al. 2000).

The territory that is now Kazakhstan has changed hands numerous times throughout history. It was

¹ The Commonwealth of Independent States (CIS) unites Azerbaijan, Armenia, Belarus, Georgia, Kazakhstan, Kyrgyzstan, Moldova, Russia, Tajikistan, Turkmenistan, and Ukraine.

first part of the Persian Empire, then the Mongol Empire, and eventually came to be ruled by Russian tsars and finally Soviet Russia. As early as the 16th century, however, a distinct Kazakh culture, with common linguistic and familial ties, emerged. These people were herders, nomadic pastoralists, who lived transient lives in constant search of fresh pastureland to support their livestock-based economy. The region's endless steppes and semi-desert land provided ample grazing to support the small population.

Soviet Era Mismanagement

The Virgin Lands Campaign. The collapse of the Russian Empire following the Bolshevik Revolution of 1917 led to the emergence of republics throughout the former empire; Kazakhstan became a Soviet republic in 1936. During and after World War II there was an influx of newcomers, many of whom were forcibly exiled to the republic to work in gulags, or government work camps. The population of the republic steadily grew. In the mid-1950s, Soviet central authority in Moscow deemed that Kazakhstan's steppes and grasslands were to be brought into production to supply wheat to the Soviet Union. This ambitious program, which came to be known as the Virgin Lands Campaign, was carried out between 1954 and 1964. Kazakhstan subsequently became the third-largest grain producer and second-largest net exporter among Soviet republics (Meng et al. 2000).

More than 300,000 people, mostly Ukrainians, arrived in northern Kazakhstan to begin farming the more than 300,000 square kilometers of land that came under the plow. This massive shift in land use and influx of people severely disrupted the pastoralists' already endangered balance of seasonal herding cycles. Land previously employed for grazing was plowed under for wheat production and received heavy inputs of fertilizers and chemical pesticides.

The first harvest was a remarkable success, with more than half of the Soviet Union's 125 million metric tons of grain produced in 1956 coming from one eighth of the Soviet Union. Thereafter, however, harvests steadily declined, and by the 1960s the soil had been so drained of nutrients beneficial to wheat that productivity languished.

The continued conversion of pastureland to agricultural land during the 20 years from 1960 to

1980 led to deterioration of soils and loss of productivity on many of the best rangelands in Kazakhstan; the fodder base was drastically reduced. Because of the abandonment of farmland converted from rangelands following the Virgin Lands Campaign's short success, 12.8 million hectares of land previously planted to wheat were no longer in use by 2000. Research from the Kazak Fodder and Pasture Institute has shown that full recovery of these abandoned steppe lands would take 30 years (Schillhorn van Veen et al. 2004). Further ecologically risky policies in the 1970s promoted livestock development and the creation of large livestock farms for the production of meat and wool; these programs quickly led to rangeland overgrazing and deterioration (Schillhorn van Veen et al. 2004).

Kazakh livestock production was fairly centralized under the Soviet Union. Rural herders relied on stored fodder during the winter and obtained essential provisions and services from the government. The declining land productivity and the difficult transition in the mid-1990s away from collective and state-owned farms forced many livestock owners to sell off herds to maintain agricultural production or to pay off debts (Schillhorn van Veen et al. 2004). Sixty percent of the livestock herd nationwide was disposed of between 1993 and 1999, with corporate farms slaughtering, exporting, or selling 90 percent of their inventories (Dudwick et al. 2005).

White gold. A decade before the Virgin Lands program, in the southern part of the Kazakh republic and throughout much of the Uzbek republic, irrigated cotton became the "white gold" boasted about by Soviet elites. Moscow had begun a campaign to achieve self-sufficiency in cotton production, relying on the drylands of the Aral Sea basin for its cultivation. Irrigation projects were begun on a massive scale (Feshbach and Friendly 1992).

The land use changes ushered in bumper harvests during the first decade of cultivation. The area of irrigated land grew by more than 30,000 square kilometers between 1950 and 1988, mostly in southern Kazakhstan, Uzbekistan, and Turkmenistan.

But poorly designed irrigation schemes, shortsighted planning, and corruption at all levels of the

process soon revealed the plan as a disastrous pilaging of natural resources. Water withdrawals were made indiscriminately to support this massive increase in irrigated area. River flow diminished until 97 percent of annual water resources were consumed, leaving only four cubic kilometers to flow into the Aral Sea. In some dry years in the 1980s, no water at all flowed into the Aral Sea (FAO 2003). The waters of the Syr Darya and Amu Darya, the sea's two feeder rivers, were diverted into a network of unlined irrigation furrows that wasted at least half—and sometimes as much as 90 percent—of the water intended for the cotton fields. Despite elaborate drainage networks consisting of more than 100,000 miles of drains, the system was so poorly engineered that water tables rose to within a foot of the surface from original depths of more than 30 feet. Waterlogged fields led to the salinization of soils and a subsequent decline in agricultural productivity. As productivity plummeted, peasants were forced to compensate for the lost harvests by converting their private plots and orchards to cotton cultivation. These private plots had not only supplied fruits and vegetables, but also helped to hold fractional amounts of moisture in the soil. Hunger and malnutrition spread. The profits of the cotton monoculture remained with the political elite, while the land once used for grazing livestock or growing produce was continually converted to cotton production (Feshbach and Friendly 1992).

Desertification has encroached on more than 2 million hectares in the Aral watershed. The city of Aralsk grew up around a fishing industry that had thrived on the sea's abundant flounder population. The Aral's waters used to lap against the main city dock not more than a 10-minute walk from the central market. Now, a three-hour overland journey across the former sea bed is required to reach the sea's shores. The rusted hulls of enormous fishing vessels rise up from a sea shell-littered desert floor—testaments to the region's former marine landscape. A total of 13 fishing enterprises once operated in the Aral region; more than 10,000 people lost their jobs with the recession of the sea's shores. In the Kyzylorda oblast² where the sea is located, three-quarters of the 16,000 unemployed people in 1995 were from rural areas, and

nearly all of them were forced to leave owing to the halting or partial cessation of fishing operations (UNDP 2004).

A utopian quest. The Soviet ethos was steeped in defying and controlling the environment. Its identity relied on surmounting the insurmountable—at least on paper. The mismanagement and poor design of the cotton irrigation systems in the Aral basin were only the first and most visible component of a bumbling system that undermined the sustainability and promise of a Marxist utopia. "The utopian quest became a blinding compulsion ... that justified destruction and deceit on a huge scale in the name of progress toward an earthly paradise" (Feshbach and Friendly 1992, 28). The quest would prove to be folly. Soviet policies aimed at the unsustainable exploitation of natural resources in Kazakhstan undermined the republic's ability to reap economic gain from its endowed resources. The republic was left ill prepared to adjust to the social, economic, and political upheaval that followed the precipitous collapse of the Soviet Union in 1991.

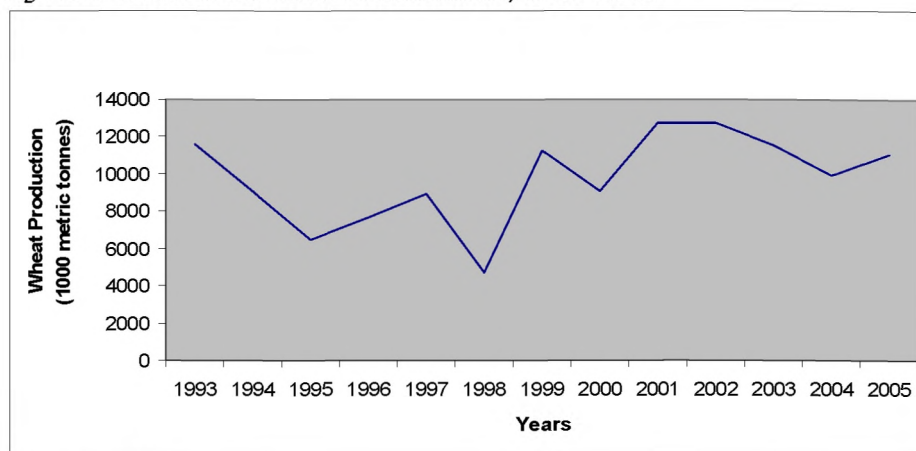
The Post-Independence Market Transition

The agricultural sector. The collapse of the Soviet Union threw the economy of the newly independent nation of Kazakhstan into a tailspin. Agricultural production plummeted. By 1998 meat and wheat production, previously robust, had fallen to less than half of their 1993 levels (FAO 2006) (see Figures 1 and 2). The decline in production resulted from numerous factors.

Agricultural sector losses were caused primarily by a continuation of state controls on marketing (which depressed output prices) while input prices were liberalized (Gray 2000). The state's withdrawal from pricing policy regulation led farmers to pay increasingly high prices for inputs, energy resources, and maintenance while earning ever smaller profits for their products. During the post-collapse reform years from 1992 to 1995, prices for industrial production and technical services increased almost 27,000 times, while those for agricultural production increased only 3,948 times. To buy one ton of fuel, producers of agricultural commodities had to sell 2.0 to 2.5 metric tons of grain. Soviet era combines and aging machinery prevented growth in the sector. Labor remuneration decreased as well, with producers of agricultural commodities bearing substantial proportions

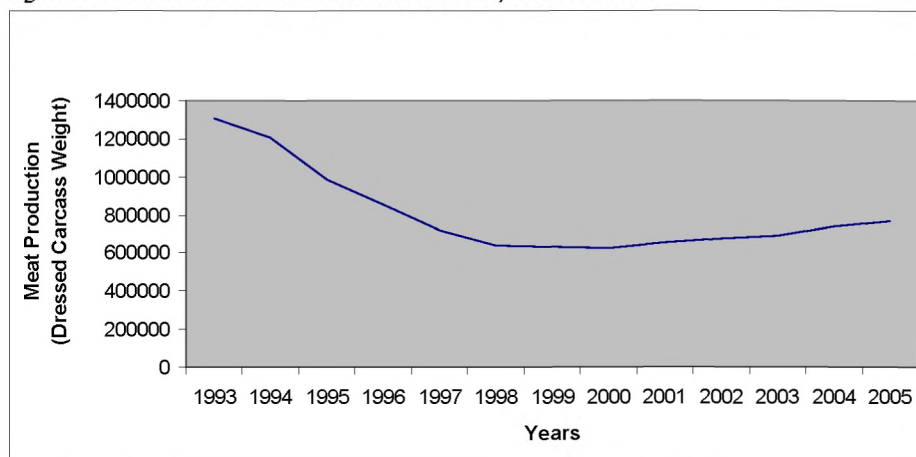
² Oblast is a term used in Eastern Europe and throughout the former Soviet Union to denote a subdivision of a nation similar to a province or region.

Figure 1: Wheat Production in Kazakhstan, 1993–2005



Source: FAO 2006.

Figure 2: Meat Production in Kazakhstan, 1993–2005



Source: FAO 2006.

Note: All data shown relate to total meat production from both commercial and farm slaughter.

of the production costs while receiving compensation for only 20 to 30 percent of the final price (Baydildina et al. 2000).

The government's withdrawal from economic development placed market regulation in the hands of monopolists who continued to impose basic input costs on farmers while increasing their own profit shares. The state's refusal to finance and provide credit support to producers of agricultural commodities, in addition to reductions in state spending overall and for the agricultural sector in particular, amplified the difficulties faced by agricultural producers (Baydildina et al. 2000).

The economies of the republics of the Soviet Union were highly integrated with centralized support for different sectors. After the collapse of the Soviet Union, Kazakhstan's agricultural sector faltered without this support and integration. Kazakhstan's livestock sector, for instance, traditionally relied upon Russian markets and meat-processing facilities, and the decline in the livestock sector in the 1990s resulted largely from this loss of integration. As privatization of farms began to increase in the early 1990s, small-scale farmers faced the difficulty of managing a private operation without the technical and resource assistance of a central planning system or the support of a farm

collective. The emphasis on research and technological development present during the Soviet era disappeared; to further complicate matters, farm equipment and machinery passed down to farmers of the newly independent nation were from a by-gone era and were largely rusting into obsolescence (World Bank 2004).

Severe weather events—an oppressive drought in 1998 and continued severe weather in 1999 and 2000—combined with the degraded land resources inherited from the environmentally negligent Soviet system were other key factors in the decline of the agricultural sector. Ill-advised land reforms exacerbated the sector's economic downturn.

Land tenure reform. Under the Soviet Union, nearly all rangelands and agricultural lands were state owned and used by state (*sovkhoz*) and collective (*kolkhoz*) farms. Following independence most of these farms were dissolved, and laws were enacted to regulate land use. Efforts to privatize land shares began in 1993 with the in-kind distribution of property shares to former members of collective farms. The goal was to reduce the size of corporate farms, restructure them, and increase the number of family farms. From 1993 to 1998 the area of agricultural land classified as family farms increased fivefold, while corporate farms declined by two-thirds. Although some of this corporate farmland area was transferred to family farms, most of the land was marginally productive and simply removed from cultivation (Dudwick et al. 2005).

Farmers did not easily transition into a private-holdings system. Most were accustomed to the financial and technical support present in larger-scale collective farm operations, not to mention the security of state-backed inputs and guaranteed markets within the republics of the Soviet Union. The new regulations were largely ineffective, as property owners simply reunited to form production cooperatives; little change in patterns of ownership, management, or control emerged (Gray 2000).

Corruption played a major role in the transition as well. Those with the influence and the means (namely the head, or *kolkhoznik*, of a collective farm) commonly seized lands for themselves. People with independent land shares were often duped into leasing shares to restructured farms that avoided lease payments, effectively severing any

ownership ties to the land. Lack of oversight and poor enforcement of regulations contributed to the unbalanced landownership patterns in the years following independence.

The limited progress in restructuring ownership patterns resulted largely from the fact that former state and collective farms were never subjected to hard budget constraints. By 1998 the overwhelming majority of remaining corporate farms were unprofitable, and a debt crisis ensued that led to the buyout of many farms by large, vertically integrated grain companies. In 1998 the government passed the Bankruptcy Law, which began to encourage the liquidation of insolvent and unviable farms (Gray 2000).

Rural welfare in Kazakhstan today. In the past 10 years Kazakhstan has made larger strides in improving its health and economic situation than have the neighboring Central Asian republics (United Nations 2005). The former Soviet republic has also received increased attention from foreign governments and international investors owing to its sizable oil reserves in the region of the Caspian Sea as well as its mineral and natural gas reserves. These factors give the impression that the welfare of the Kazakh people is on the rise; the country is beginning to experience, however, a stark rural-urban divide.

Rural poverty in Kazakhstan has gone from being twice as high as urban poverty in 2001 (38.5 and 20 percent, respectively) to almost three times as high in 2004 (24.8 and 9.2 percent). Oblast of residence is the strongest determinant of poverty in Kazakhstan. The largely rural Kyzylorda, South-Kazakhstan, and Mangystau oblasts show considerably higher poverty levels (>18 percent) than do the eastern oblasts or the intensively developed cities of Astana and Almaty (1–3 percent). Opportunities to earn sufficient income for an adequate standard of living are considerably less in rural areas. Most of the economic activity of the country (trade, service, construction, and oil and natural gas extraction) is centered in urban areas. Little investment, public or private, is being funneled into the agricultural sector or rural economies. Though wages have risen, the agricultural sector provides relatively low incomes, especially in the traditionally agricultural southern regions. In 2004 the ratio between the highest and lowest poverty rate in oblasts was 26.5—compared with 4.1 in 1999.

The urban-rural divide is highlighted starkly when placed against the backdrop of declining health, which plagues mostly rural populations. Although discrepancies in data exist owing to differences in measuring outcomes, the Demographic and Health Surveys conducted in Kazakhstan in 1995 and 1999 showed that over 10 years (1989–1999) the infant mortality rate increased by 24.5 percent and the under-five mortality rate increased by 26 percent. Distribution of child mortality by region showed that losses were biggest in the southern region (34.6 percent), a little less in the western region (21.6 percent), and lowest in the eastern region (9.1 percent) (the southern and western oblasts are far more rural than the eastern oblasts). Similarly, micronutrient deficiencies are more prevalent among rural populations: prevalence of iron deficiency anemia among pregnant women increased from 58 percent in 1999 to 63.4 percent in 2003. Vitamin A deficiency was found in 28.6 percent of children 6–60 months old. This level exceeds the 20 percent threshold beyond which the World Health Organization (WHO) considers vitamin A deficiency a serious problem, and it indicates inadequate health status and health care in the country, especially among the rural poor.

The anti-poverty Targeted Social Assistance (TSA) scheme was introduced in January 2002 to bolster existing social assistance programs. Local governments are fully responsible for organizing and delivering TSA (ILO 2004). The 2001 Law on Local Public Administration in Kazakhstan defined the role of local councils and executive bodies as implementing state policy. Local budgets are supposed to finance TSA as well as education and health services, but these mandates are largely unfunded because localities cannot independently establish tax rates or determine the tax base (Dudwick et al. 2005). Most local governments lack the support and autonomy necessary to effectively implement and monitor such social programs. Whereas satisfaction with provision of basic services such as electricity, gas, drinking water, and telephone are high, a lower percentage of households now benefits from a range of social services (medical care, public transportation, heating fuel, school subsidies) than did so before the dismantling of collective farms (Dudwick et al. 2005). In addition, perceptions of levels of crime, domestic violence, and alcohol use among youth and adults have also risen markedly, indicating a pervasive

social instability despite advances in basic infrastructure.

Linking resources, policy, and people. Health statistics in Kazakhstan today demonstrate that despite progress toward meeting the Millennium Development Goals, government efforts at addressing public health have not affected all citizens equally. Rural residents—those most closely tied to the land and other natural resources for their livelihoods—seem to carry a disproportionate burden of the nation's health woes and social instability. The management of natural resources and the sustainable and efficient use of agricultural resources are intrinsically linked to the policies that dictate patterns of ownership. The stewardship of such resources affects the health and welfare of those who depend on the resources directly, and even indirectly, for livelihoods and as a place to live and prosper.

Agricultural production has steadily recovered since the start of the new millennium. Wages and agricultural prices have increased. These gains have been driven largely by Kazakhstan's wealth of petroleum, natural gas, and mineral reserves and the global rise in oil prices. The gains in the energy sector, however, must not overshadow the fact that this wealth is unevenly distributed and does not reach those most disenfranchised by the market transition. The growth in disparity between urban and rural poverty reflects the need to bolster support for rural livelihoods. Redressing such health and poverty discrepancies will involve examining fundamental issues of natural resource management, land ownership, and agricultural policy.

Policy Issues

Sustainable Agricultural Production

Though agricultural output declined in Kazakhstan throughout the 1990s, total output increased at an average real annual rate of 8.2 percent between 1998 and 2003, with agricultural production growing by an annual average of 10.5 percent (World Bank 2004). Despite gains, however, agriculture contributes only 8 percent of Kazakhstan's gross domestic product (GDP), and agriculture's share in the economy has shrunk owing to growth in the extractive petroleum industry. The agricultural sector has significant untapped potential, given that both crop yields and livestock productivity are well below levels reached in countries with analogous

environments (World Bank 2004). Individual (family and household) farms seem uniquely able to fill the current deficits in agricultural productivity, but an adequate legislative, financial, and knowledge infrastructure in Kazakhstan does not exist to support these farms and the rural residents that depend on them for livelihoods and welfare.

The number of individual farms and the arable land area managed by these farms have more than doubled in Kazakhstan since 1998 (World Bank 2004). This change in farming scale affects farmers in northern and southern Kazakhstan differently. In rainfed northern Kazakhstan crops are grown on a large scale as part of machinery-dependent corporate farms, whereas in the south farming is heavily dependent on labor and irrigation water and family farms predominate. Currently about 40 percent of cultivated land is in individual farms nationwide (Dudwick et al. 2005).

Until about 1998 yields from individual farms were somewhat higher than from corporate farms, but this efficiency gap widened in 1999 and continues to grow as the gains corporate farms made by taking marginal land out of production have waned. Much of the profitability of corporate farms depends on government support and credit programs (supported through oil revenues), but even with this assistance, nearly half of all corporate farms remain unprofitable (Dudwick et al. 2005). A clear discrepancy exists between land tenure reform measures that are pushing to eliminate share privatization in favor of concentrating corporate farm ownership and management and the lack of efficiency and profitability of such farms; perhaps partly due to Article 170 of the 2003 Land Code, the land area dedicated to individual farms has grown more slowly in recent years than in the 1990s (Dudwick et al. 2005).

In 2003 the Ministry of Agriculture developed two programs to stimulate agricultural growth and rural development: the 2003–2005 State Agro-Food Program and the Rural Development Program (RDP). These programs aimed to increase state support of agriculture, strengthen linkages between agricultural research and agricultural policy, and improve the legal framework for agricultural growth and rural development. The State Agro-Food Program, which earmarks a percentage of the state budget for support of agriculture (8 percent in 2003), allows agricultural producers a 40 per-

cent subsidy on inputs such as fuel, lubricants, seeds, and fertilizers. Bureaucratic requirements, however, appear to act as a disincentive for small farms to gain access to these subsidies (Dudwick et al. 2005). Moreover, credit from commercial banks favors large farms; small farm credit, especially long-term credit for equipment purchase, is wholly inadequate. Any farmer may lease agricultural machinery at subsidized interest rates, but such machinery is usually more appropriate for larger farm operations (Dudwick et al. 2005). These policy measures seem motivated by a desire to promote rural development but miss the mark in establishing equitable access to incentives and benefits that might assist small-scale farmers.

Many rural managers of individual farms face the additional challenge of maintaining viable operations with little farming experience, meager knowledge of how to manage the business of farming, limited access to technology, and lack of research support. The research, technological development, and knowledge dissemination infrastructure that underpinned the state and collective farm systems of the Soviet era largely vanished after the collapse of the Soviet Union. The crop of inexperienced private farmers that emerged at the same time has left enormous gaps in the potential for agricultural productivity and sustainable livelihoods among Kazakh farmers. Ten agricultural research centers employing more than 1,200 scientists are funded by just 0.3 percent of agricultural GDP. These centers seek commercial funding to supplement their limited public resources, and as a result, research responsibilities are often neglected to prioritize the interests of donor institutions. Most important, these centers lack a system to disseminate agricultural research findings and new technologies to agricultural producers (World Bank 2004).

Kazakhstan also faces the issue of agricultural diversification. Wheat and cotton together account for 90 percent of agricultural exports. Though the country has traditionally relied on land-intensive agricultural products such as wheat instead of labor-intensive fruits and vegetables, limiting the diversity of agricultural products potentially limits economic development and the opportunity to improve and expand rural livelihoods. More value-added, labor-intensive products like fruits and vegetables could offset high transport costs and single crop dependency (World Bank 2004).

Kazakhstan must find a way to equitably promote sustainable agricultural production by creating appropriate incentives and an accessible rural development infrastructure that supports not only large farms and corporate farms, but also the more productive individual farms that provide income and livelihoods to millions of rural families.

Land Tenure Reform

A great deal of confusion surrounds land tenure reform issues in Kazakhstan. Despite the ostensibly egalitarian land share distribution following independence, only about 37 percent of households actually received physical land plots during land reform. Many households remain unsure of their rights as land share or land plot owners (Dudwick et al. 2005).

Many former farm managers, outside the corporate farm system, retained their primary land tenure rights and leased land from the state following independence. Leasing and subleasing arrangements led to unsustainable land use practices. Lessees and sublessees neither owned nor had secure land tenure of the properties they worked, and therefore had no real stake in the long-term viability of the land (Schillhorn van Veen et al. 2004). As part of the 2003 Land Code, which allows for private ownership of land, the government outlawed share subleasing. Article 170 of the code required subleased land shares (primarily the shares of pensioners, social and cultural workers, and the poor) to be returned to the government by January 1, 2005, if not purchased, transformed into a physical plot, or transferred to a corporate farm. The aim of the measure was to end share privatization and concentrate corporate farm ownership; this measure likely reduced the amount of land in individual farms, which were largely the subleasers of land (Dudwick et al. 2005).

Institutional oversight of both private and state-owned land is another challenge facing Kazakhstan. Land allocation and management under Soviet authority was regulated by the Ministry of Agriculture; land use management schemes focused solely on economic and production interests. Following independence, these responsibilities shifted to the Land Resource Management Agency, which had a broader mandate to manage issues concerning land tenure, land use, and price plotting. The management roles of these two government institutions as well as the Ministry of Environment may need to

be more clearly delineated to provide for efficient land management oversight. In addition, the sheer size of the country, combined with its dispersed, low-density population, necessitates greater local responsibility for the oversight of land management and reform issues (Schillhorn van Veen et al. 2004).

Kazakhstan faces the additional hurdle of cultural perceptions when considering the land tenure question—for centuries the notion of private property did not exist among the nation's nomadic peoples. The traditional Kazakh economy of nomadic livestock production was based on grazing cycles from winter to summer pastures; the conservation of resources and nature was paramount. Many Kazakh pastoralists are still becoming acquainted with this foreign model of land tenure while at the same time struggling to maintain their identity and pride.

The challenge of land tenure reform in Kazakhstan rests in the clarity and equality of future policies. A 2003 survey found that while 60 percent of households interviewed thought land allocation was fair (though at the time of the interview, Article 170 had not come into effect), many rural inhabitants were unclear about the process of land reform and their rights as land share and land plot owners (Dudwick et al. 2005). Legislation such as Article 170 of the 2003 Land Code has helped to shift the distribution of land in Kazakhstan away from individual farms and toward corporate farms, while at the same time rural residents remain confused about their rights and the range of opportunities available to them for benefiting from their land entitlement.

Responsible stewardship of the natural resources, upon which current and future agricultural productivity and rural livelihoods depend, represents an even greater challenge for Kazakhstan.

Rangelands

Sixty percent of the livestock herd in Kazakhstan was disposed of between 1993 and 1999 (Dudwick et al. 2005).³ There are many reasons for this decline in livestock populations: the halting of import and subsidized delivery of feed, the breakdown of the water supply system, the need for debt repayment,

³ This section draws on Schillhorn van Veen et al. (2004).

massive emigration from the country, the use of livestock in barter during the period of rapid inflation following the Soviet collapse, the breakdown of transport between remote farms and markets, and declining urban purchasing power. Livestock inventories plummeted from an estimated 9.7 million head of cattle before the Soviet collapse to 4.5 million in 2002. Likewise, inventories of sheep and goats stood at 35.6 million before 1991 and declined to 10.6 million by 2002. Whereas corporate farms liquidated the large majority of their livestock, only 5 percent of the inventories of individual and family farms were eliminated (Dudwick et al. 2005). Livestock holdings are now widely dispersed across a large number of family farms and smallholders—private ownership in the livestock sector is currently estimated at 92 percent. The total number of households depending on livestock has increased during the past decade to an estimated 1.6 million.

The private herds of individual and family farms are small and lack public support. The continuous decline in livestock yields since the late 1990s can be explained by lack of marketing, feed, fodder, and veterinary services, as well as other public support targeted toward smallholders (Dudwick et al. 2005). The lack of organization of long-distance grazing has resulted in overgrazing and deterioration of pastures around inhabited areas. More distant pastures have been abandoned as the rural populations that once tended their flocks there have left. Deterioration of pastureland is threatening the critical fodder base in the country.

Fodder is an important rangeland resource. Hay collection from natural pastures has traditionally been a crucial component of livestock husbandry. In northern areas winter feeding depends largely on stored fodder, and in southern regions traditional seasonal migration systems provide for optimum fodder availability. The preservation of fodder has become a salient issue because of the declining incomes of rural herders and their consequent inability to migrate with their herds. Pastoralists are becoming increasingly stationary, unable to bear the risks of theft or pay the cost of herders to help transport flocks to mountain pastures in the summer. In addition, fodder storage in the form of silage⁴ is not common. Plant fodder production via

legumes is a common practice, but even this land use is risky as production can expand into vital grassland and can further lower water tables through withdrawals for production needs. While seasonal cycles of herding are increasingly becoming a vestige of a vanishing nomadic culture, the need remains for an integrated system of rangeland management that enables preservation of the fodder base through expanded access to pasturelands. Kazakhstan has the most extensive permanent pasture per animal in the world—this tremendous resource must not be squandered (World Bank 2004).

Water Resources

Kazakhstan is an arid country. The drier desert regions to the south receive less than 100 millimeters of precipitation annually. The proper management and conservation of water resources in the country is thus critical not only to the long-term sustainability of industries that heavily depend on water but also to the health and well-being of the more than 15 million people who depend on a consistent and high-quality water supply for domestic use (CIA 2007). Unfortunately, Kazakhstan's water resources have traditionally been exploited for short-term economic gain without consideration of the broader consequences of overdrafting and polluting rivers and seas. Nearly all of Kazakhstan's watersheds are threatened by exhaustion of supply or degradation of water quality (for example, the Ural-Caspian, Irtysh, Ishim, Nura-Sarysu, Tobol-Torgai, and Balkhash-Alakol basins), but one in particular stands apart as a high-priority area for water resource rehabilitation: the Aral-Syr Darya basin.

Perhaps more than any other example, the Aral Sea crisis defines the relationship between negligent stewardship of a natural resource and the resulting impact on public welfare. The cotton monoculture that sprang up around the sea in the 1950s has left a region marred with soil infertility, poisoned water, and chronic disease. Failure to adopt anti-erosion measures has led millions of tons of soil to simply blow away. The soil that remains suffers from increased salinization both from poor drainage and from wind depositions on fields. Per capita income in water-deficient areas across all oblasts is almost half the "official minimum living

process preserves the forage and causes it to retain more of the initial nutrient content of the plant than hay.

⁴ Silage is a type of fermented forage made from grass crops such as corn or sorghum. The fermentation

requirement” (UNDP 2004). Outmigration to urban areas is a serious problem. With the decline of the rural economy, residents increasingly seek work in urban centers, adding to population pressures in those areas and diminishing the prospects for a robust rural labor force.

Human health has also been directly affected. Long-term exposure to pesticides through inhalation in dust storms, through polluted water, or through the diet (from chemicals applied to or deposited climatically on agricultural fields) have allowed toxic organochlorines and dioxins to accumulate in local residents. Tainted breast milk can pass the toxins on to infants. Not surprisingly, high rates of chronic disease, mental retardation, and impaired physical development have been reported in the region (Zetterström 1999). The prevalence of respiratory illnesses and tuberculosis has also risen steadily, as have rates of cancers, hepatitis, and intestinal disease (Wiggs et al. 2003).

The Aral Sea now exists as two distinct bodies of water: the Northern Aral Sea (NAS), also known as the Small Sea, and the larger Southern Aral Sea. Under its Northern Aral Sea project, the World Bank helped build the eight-mile Kok-Aral Dam, completed in August 2005, which separates the two parts of the sea. Prior water control structures on the sea and on the Syr Darya largely failed to restore the delta or increase water levels. The ability of this new initiative to restore sea levels and river flows and sustain agricultural and fish production remains to be seen. The involvement of the World Bank in this project, as well as the support from the Rural Development Program in assisting residents of the Aral region, is a promising start to revitalization of the region. Progress is slow, however, and signs of continued misuse of resources abound.

In spite of decreases in industrial production and in wastewater discharge, pollutants from chemical industries, petroleum processing, and machine-building industries are still a major threat to surface water quality in Kazakhstan (UNDP 2004). Agricultural irrigation withdrawals from rivers remain intensive. The chemicals, salts, and other pollutants in return-flow water only further degrade water supplies. In addition, the developing industries around the oil and gas field reserves in the Caspian Sea region are aggravating a delicate ecosystem.

Coastal territories are already heavily polluted by oil products.

Issues of water resource management in Kazakhstan put the relationship between health and environment in stark relief. Kazakhstan inherited the burden of degraded water resources from its Soviet forebears, but it has the moral and civic responsibility to make all efforts to rehabilitate and preserve the vitality of the country’s rivers, lakes, and seas.

Stakeholders

The Land Resource Management Agency

Charged with regulating land allocation and management, the Land Resource Management Agency is the government agency responsible for reshaping the landscape of the country in terms of both land ownership and land use. The agency’s success in meeting the demands of the nation’s transitioning market economy will help determine the strength of the agricultural sector, the success of new private farming operations, and ultimately the welfare of the rural poor, who depend on the natural resource base to make their living.

The Ministry of Agriculture

Responsible for the State Agro-Food Program and the Rural Development Program, the Ministry of Agriculture plays a vital role in supporting rural agricultural producers. The degree to which the ministry is able to equitably provide for farmers at varying scales of operations and integrate with the missions of the Land Resource Management Agency, as well as support the budgets of local governments and research centers, will determine its potential impact on rural livelihoods and welfare.

Neighboring Central Asian States

The nations of Central Asia share a common history. They all formerly existed as republics of the Soviet Union. As part of the Soviet Union, the Central Asian republics had close trade ties with one another and their economies were interconnected. Following the breakup of the Soviet Union, trade relations between the newly independent nations initially declined but have recovered somewhat in subsequent years. Coalitions between the states are natural, given that they

share watersheds and resources, trade routes extend into neighboring countries, families and shared cultures reach across borders, and the welfare of one will help determine the welfare of another. The Caspian Environmental Program (CEP) and the Aral Sea Basin Program (ASBP) are just two examples of regional collaborations designed to ensure the future of shared natural resources. Kyrgyzstan, Tajikistan, Turkmenistan, and Uzbekistan have not prospered to the degree that Kazakhstan has in the post-Soviet years. They rely on Kazakhstan's markets and exports to maintain the viability of their own trade and economies. For these neighboring states, helping to secure the welfare of Kazakhstan's citizenry will only benefit their own.

Civil Society in Kazakhstan

Although thousands of nongovernmental organizations (NGOs) operate in Kazakhstan, the notion of civil society is a fairly new concept in the former communist state. The quality and organization of NGOs vary widely, with some imparting enormously helpful services to their host communities and others providing little more than an excuse to steal from the public. This sector of Kazakh society has the potential to strongly benefit the nation's rural poor. Environmental NGOs focused on the sustainable stewardship of forest lands, rangelands, and watersheds are quite active, as are those geared toward securing the livelihoods of rural farm workers and fishers affected by natural resource degradation or the social upheaval of the post-Soviet years. The seeds of a flourishing civil society exist in Kazakhstan, but they will need proper support and regulation as well as partnerships for change in individual communities.

The International Community

The World Bank has been a familiar presence in Central Asia since the collapse of the Soviet Union, helping to fund projects like the Kok-Aral Dam that recently was erected to preserve the Aral Sea and restore fish populations in the region. The International Red Cross has also been active in the region around the Aral Sea in recent years, working to restore livelihoods and fight diseases such as tuberculosis and hepatitis. Even foreign countries on the other side of the globe have taken notice of Kazakhstan in the past decade owing to its wealth of oil and natural gas reserves. The wealth flowing

from foreign investment in these resources ensures that the international community will have its fingers on the pulse of the region for years to come. The support of such a far-flung community of governments and agencies could benefit Kazakhstan's people in the long term through their investments and the resulting stimulation of the economy. The key challenge for the government will be how to equitably channel the benefits of those investments to all its citizens.

Agricultural Producers

The stakes of reform's success or failure are highest for agricultural producers in rural areas of Kazakhstan. The economies of urban centers are benefiting greatly from foreign investment and the burgeoning service, construction, and banking sectors. The livelihoods of farmers, herders, and fishers are more directly tied to the land, however, and depend on the quality of existing natural resources. The majority of farmers in rain-fed northern Kazakhstan are part of large, machine-based operations, whereas those in the irrigation-dependent south largely manage labor-intensive individual farms. The interests of these two groups will differ based on the scale of incentives future policies may provide and on the resources allocated to rural development and natural resources by region. The encroachment of farms into a traditionally nomadic culture has long been a contentious issue among agricultural producers in Kazakhstan, and herders and farmers often butt heads over land issues. Herders require more open land for grazing herds, and farmers tend to want to plow that land to cultivate crops. In addition, runoff from agricultural chemicals often degrades the water quality of streams, rivers, and lakes in watersheds, thus affecting the livelihoods of fishers. Finding compromises between the diverse needs of these different stakeholders will continue to pose a challenge to Kazakhstan in the years ahead.

Policy Options

Sustainable Agricultural Production

The relatively high productivity of individual farms compared with corporate and large farms, as well as the abundant livestock resources owned by family farms and smallholders, points to the key role of these small-scale, private agricultural producers in supporting the economic foundation of

Kazakhstan's agricultural sector. Policy options centered on sustainable agricultural production should first and foremost look to sustaining these producers.

The creation of the State Agro-Food Program and Rural Development Program has demonstrated the Ministry of Agriculture's initial willingness to take issues of rural poverty and agricultural assistance seriously. Bureaucratic obstacles that impede access to subsidies must, however, be addressed. Access to leased equipment appropriate for varying scales of farming must be improved, as should support for the transportation and food-processing infrastructure required for a healthy and functioning food system. The government must also encourage financial institutions to extend long- and short-term credit to smallholder agricultural producers. Rural credit programs, preferential taxation, and insurance for such producers might be considered.

The lack of state support for the country's agricultural research centers is impeding research efforts, the advancement of new technologies, and ultimately the ability of agricultural producers to enhance productivity and develop their livelihoods. In addition to increasing funding for research and development, the government should enhance opportunities for knowledge sharing both within regions and across oblasts. Given the inexperience of many Kazakh farmers, state or privately funded conferences, conventions, and focus groups, as well as university and research center-sponsored events, could give farmers, professionals, and researchers opportunities to share positive and negative experiences, exchange knowledge and technology, and strengthen support networks.

Kazakhstan's government has recently expressed a greater interest in diversifying its economy away from oil dependence and pursuing rural development (UNDP 2004). Future policy should reflect this shift in priorities and strengthen production of fruits and vegetables to decrease reliance on wheat and cotton alone. Offering incentives to stimulate small and medium-sized businesses domestically could enhance domestic markets for such products as well as support the creation of new businesses in the food-processing and transportation industries, upon which the agriculture sector relies for sale of goods.

Above all, policy makers need to apply common sense and humility when considering policy alternatives. The knowledge and talents of local communities can provide in-depth and practical direction for policy. Whether policy makers consider the unique cultural, historical, and geographic characteristics of certain regions and populations can largely determine how well a policy will be accepted by a community and to what degree it will be effective. In Kazakhstan this is particularly true—the nation houses an abundance of different cultures with histories and values as diverse as the myriad societies that shaped the region.

Land Tenure Reform

Land tenure reform in Kazakhstan must be grounded in clearly defined, equitable land distribution policies that provide local and regional officials with adequate authority and resources to enforce laws and respond to the concerns of land share and land plot owners. In light of the greater productivity of individual farms and the potential of these operations to supplement family wage incomes and food stores and provide for secure livelihoods, future policies should consider subsidies for land share owners and former sublessees. People eligible for Targeted Social Assistance or involved in low-wage labor could be specially targeted for assistance in purchasing land for private use in order to supplement their income and improve food security.

Large corporate farm managers still exercise a great degree of power in local and regional circles and are comparable to town mayors. Unfunded local mandates and the lack of local self-government in Kazakhstan are considerable impediments to enforcement of land reform measures and to checks on the corruption of powerful farm managers. Changes in the power distribution at different scales of government, as well as increases in budget appropriations to local authorities, should be considered to allow local government bodies to carry out their civic duties. If proper resources were allocated, greater responsibility could be placed on local and regional officials to ensure that farmers are aware of their rights as landowners and understand legislation. Communication channels could be opened to allow agricultural producers to voice questions and concerns about land reform measures. A system of checks and balances, initiated at the state level and extended to regional

and local levels, would also improve the protection of individual land rights (not to mention civil rights), especially of the people most disenfranchised by the fallout of the Soviet collapse and most at risk of food insecurity and general poverty.

Rangelands

More public funding is needed for services that support the health and productivity of the livestock holdings of individual and family farms. Improved access to high-quality veterinary services and feed, as well as appropriate marketing strategies, must be addressed. Policy options for how best to preserve the nation's fodder base must also be weighed. Although the historical nomadic herding system is fading in present-day Kazakhstan, the system's inherent preservation of rangeland resources offers lessons. Creative solutions must be considered to increase fodder storage facilities and to develop a grazing system that allows herders to seasonally rotate herds in more extensive pasturelands to prevent overgrazing and deterioration of resources.

The potential economic gains resulting from enhanced livestock productivity should be a strong incentive for the government to bolster its public support for rural livestock holders and the rangelands resources on which they depend.

Water Resources

Water resource policy should aim to curtail and reverse current degradation of resources and rehabilitate previously mismanaged waters. More ambitious policies that limit water withdrawals to long-term sustainable levels, enact and enforce environmental restrictions on petroleum extraction around the Caspian Sea, prevent industrial waste discharge into surface and groundwaters, and seek to incrementally reverse the heavily water-dependent cotton monoculture around the Aral Sea should be considered. The Kok-Aral Dam has the potential to restore the Syr Darya delta, increase water levels and help restore marine biodiversity. Relying on this dam to solve all the ills of the region, however, would be a mistake. Local NGOs in the Aral Sea region are a unique resource that could help to immediately funnel greater support to the struggling fishers and farmers of the region.

The International Red Cross has intervened in the regions around the Aral Sea to deal with the initial outbreaks of tuberculosis and chronic diseases that began increasing in prevalence in the 1990s. Kazakhstan should still draw upon the support of international aid organizations in health emergencies, but increasing percentages of state oil revenues could be dedicated to rehabilitating soils, water, and the public health of the population around the sea.

Policies need to address industrial, agricultural, and domestic pollution of water resources while finding a way to revitalize watersheds to maintain their sustainability. The livelihoods, health, and welfare of the populations tied to these resources will depend upon the strength of the policies adopted and the degree to which they arise from community needs in affected areas.

Assignment

Your assignment is to advise the government of Kazakhstan on how best to reform and integrate its policies on land tenure and agriculture with proper stewardship of natural resources to improve rural health and welfare.

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